May 2021

Divining Structural Factors Related to Intervention Success or Failure: Cultural Sexism versus Other Macro-Level Factors

Blair T. Johnson
University of Connecticut, blair.t.johnson@uconn.edu

Christine M. Curley
christine.curley@uconn.edu

Technical Summary

Divining Structural Factors Related to Intervention Success or Failure: Cultural Sexism versus Other Macro-Level Factors

by
Blair T. Johnson and Christine M. Curley
University of Connecticut

Table of Contents

Introduction to Technical Summary

We wrote this technical summary is to accompany a commentary that the editors of Clinical Psychology: Science and Practice (CP:SP) invited regarding a spatial meta-analysis authored by Price and colleagues (in press). For this summary, the District of Columbia (DC) was assumed to be a state. Analyses were undertaken in Stata 16.1. The Stata database is also available in this archive, named `cultural_sexism_29apr2021.dta`. The final section gives the text of the commentary, but see the published article for the final version.

Cultural Sexism, Cultural Tightness, and History of Slave-Holding

Technical Summary

Descriptive summary of variables:

```
. sum csexism hasint loosenessstiffness pop2010 gini pctslaves1860
```

Variable	Obs	Mean	Std. Dev.	Min	Max
csexism	51	.0003922	.992935	-2.61	1.9
hasint	51	.627451	.4882944	0	1
loosenesss~s	50	50.1388	12.59583	27.37	78.86
pop2010	51	6053834	6823984	563626	3.73e+07
gini	51	.4661647	.0234549	.4063	.542
pctslav~1860	51	9.502745	17.13809	0	57.2

Variable	Obs	Mean	Std. Dev.	Min	Max
csexism	51	.0003922	.992935	-2.61	1.9
hasint	51	.627451	.4882944	0	1
loosenesss~s	50	50.1388	12.59583	27.37	78.86
pop2010	51	6053834	6823984	563626	3.73e+07
gini	51	.4661647	.0234549	.4063	.542

Note. DC is missing a value for Looseness-Tightness. `csexism`=cultural sexism. `hasint`=has intervention (1 vs. not, 0). `loosenessstiffness`=Looseness-Tightness. `pop2010`=population in 2010 census. `gini`=income inequality in 2010 census. `pctslaves1860`=percentage of slaves of total population in state or territory in 1860 census (missing values converted to zeroes).

Correlation matrix:

```
. pwcorr csexism hasint loosenessstiffness pop2010 gini pctslaves1860 , star(.05)
```

	csexism	hasint	loosen~s	pop2010	gini	pct~1860
csexism	1.0000					
hasint	-0.1948	1.0000				
loosenesss~s	0.7608*	-0.1983	1.0000			
pop2010	-0.0190	0.4360*	-0.0706	1.0000		
gini	-0.1094	0.0219	0.2249	0.3936*	1.0000	
pctslav~1860	0.4765*	0.0044	0.6569*	0.1623	0.3487*	1.0000

Note. P-values do **not weigh**t for population size. If you **do**, then:

```
. pwcorr csexism hasint loosenessstiffness pop2010 gini pctslaves1860 [aw=pop2010], star(.05)
```

	csexism	hasint	loosen~s	pop2010	gini	pct~1860
csexism	1.0000					
hasint	-0.2285	1.0000				
loosenesss~s	0.7864*	-0.2431	1.0000			
pop2010	-0.2478	0.3801*	-0.4083*	1.0000		
gini	-0.1641	0.1588	-0.1466	0.5184*	1.0000	
pctslav~1860	0.6203*	-0.0718	0.6420*	-0.0488	0.1506	1.0000

Note. Weight is 2010 population, `pop2010`. Some values for conventional statistical significance change.

Technical Summary

One significant correlation was `hasint•pop2010`, such that states with interventions are far larger in population:

Number of obs =	51	R-squared =	0.1901		
Root MSE =	6.2e+06	Adj R-squared =	0.1735		

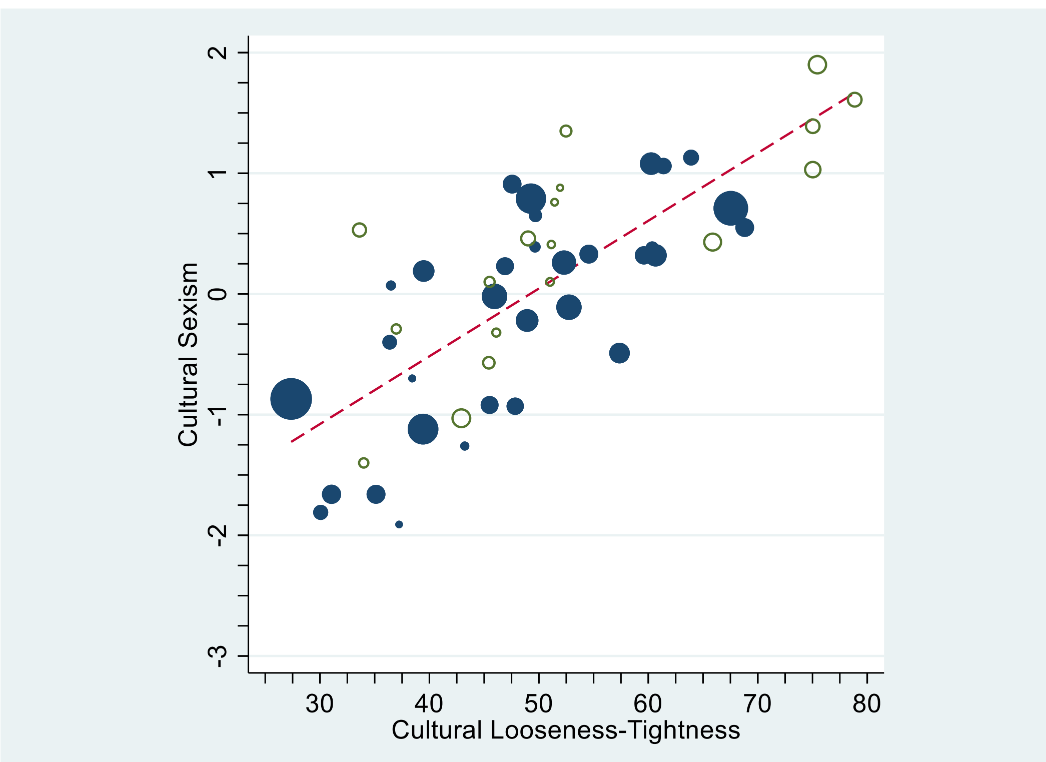
Source	Partial SS	df	MS	F	Prob>F
Model	4.425e+14	1	4.425e+14	11.50	0.0014
hasint	4.425e+14	1	4.425e+14	11.50	0.0014
Residual	1.886e+15	49	3.849e+13		
Total	2.328e+15	50	4.657e+13		

hasint	Summary of pop2010 Mean	Std. Dev.	Freq.
0	2230938.5	1477381.7	19
1	8323678.3	7717813.5	32
Total	6053834.1	6823984.3	51

States with interventions are 3.731021 times larger in population, on average.

One focus of the commentary is confounds of cultural sexism with other structural variables, the correlation matrix shows that the single largest correlation (by far, *r*=.76) is the one of sexism with looseness-tightness.

As the following figure shows, states without interventions (open symbols in green) appear not to be outliers around the regression lines, relative to states with interventions (solid symbols in navy blue).



Command:

```
twoway (lfit csexism loosenessstiffness, lpattern(dash) lcolor(cranberry))  (scatter csexism loosenessstiffness [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.33) mcolor(navy)) (scatter csexism loosenessstiffness [aw=pop2010] if hasint==0, mcolor(forest_green) msymbol(Oh) msize(*.33)), aspect(1) xtick(25(2.5)80) ytick(-3(.25)2) ytitle(Cultural Sexism) xtitle(Cultural Looseness-Tightness) legend(off)
```

And a test evaluating the residuals confirms that assumption.

```
. anova csexlooseres hasint [aw=pop2010]
(sum of wgt is   3.0814e+08)

                         Number of obs =         50    R-squared     =  0.0081
                         Root MSE      =    .539702    Adj R-squared = -0.0126

                  Source | Partial SS         df         MS        F    Prob>F
              -----------+----------------------------------------------------
                   Model |  .11426838          1   .11426838      0.39  0.5341
                         |
                  hasint |  .11426838          1   .11426838      0.39  0.5341
                         |
                Residual |  13.981338         48   .29127788
              -----------+----------------------------------------------------
                   Total |  14.095607         49   .28766545

. tab hasint [aw=pop2010], sum(csexlooseres)

            |           Summary of Residuals
     hasint |        Mean   Std. Dev.       Freq.        Obs.
------------+------------------------------------------------
          0 |   .12069651   .60711917    41786108          18
          1 |  -.01893483   .52683563   266357707          32
------------+------------------------------------------------
      Total |   9.368e-10   .53634452   308143815          50
```

Yet, residuals are correlated with the cultural sexism factor (see bottom row):

```
. pwcorr hasint pop2010 csexism loosenessstiffness csexlooseres [aw=pop2010], star(.05)

             |   hasint  pop2010  csexism loosen~s csexlo~s
-------------+---------------------------------------------
      hasint |   1.0000
     pop2010 |   0.3801*  1.0000
     csexism |  -0.2285  -0.2478   1.0000
loosenesss~s |  -0.2431  -0.4083*  0.7864*  1.0000
csexlooseres |  -0.0900   0.1033   0.6177* -0.0000   1.0000
```

Such that the stricter the culture, the larger the residual. Thus, there is a form of heteroscedasticity in the data for these two variables.

Technical Summary

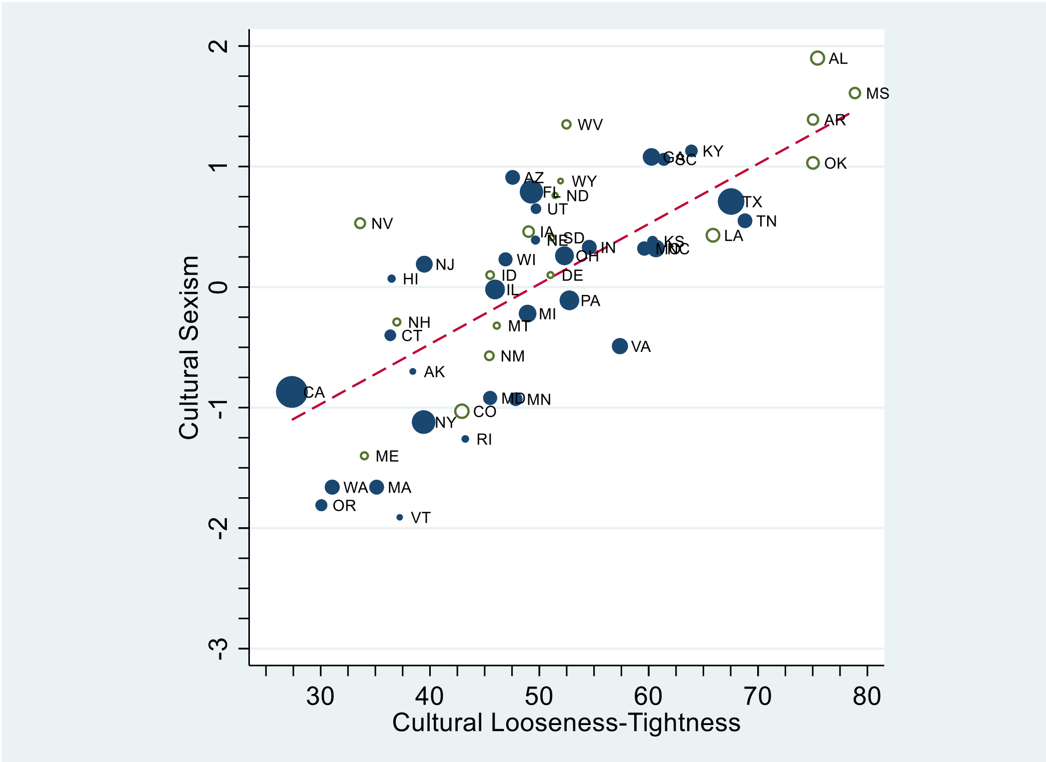
Here are the most extreme residuals, sorted from most negative to most positive (and omitting states in between):

```
. lis state hasint csexism loosenessstiffness csexlooseres if csexlooseres<-.59 | csexlooseres>.62
```

	state	hasint	csexism	loosen~s	csexloo~s
1.	VERMONT	1	-1.91	37.23	-1.299441
2.	RHODE ISLAND	1	-1.26	43.23	-.9485205
3.	MASSACHUSETTS	1	-1.66	35.12	-.944265
4.	VIRGINIA	1	-.49	57.37	-.8833507
5.	MINNESOTA	1	-.93	47.84	-.8483132
6.	OREGON	1	-1.81	30.07	-.84254
7.	WASHINGTON	1	-1.66	31.06	-.741888
8.	MARYLAND	1	-.92	45.5	-.7216722
9.	COLORADO	0	-1.03	42.92	-.703068
10.	MAINE	0	-1.4	34	-.6284369
11.	NEW YORK	1	-1.12	39.42	-.6186051
42.	UTAH	1	.65	49.69	.6394708
43.	NORTH DAKOTA	0	.76	51.44	.6622394
44.	NEW JERSEY	1	.19	39.48	.688404
45.	HAWAII	1	.07	36.49	.7174451
46.	WYOMING	0	.88	51.94	.7573161
47.	FLORIDA	1	.79	49.28	.7999079
48.	ARIZONA	1	.91	47.56	1.005644
49.	WEST VIRGINIA	0	1.35	52.48	1.200399
50.	NEVADA	0	.53	33.61	1.321003
51.	DISTRICT OF COLUMBIA	0	-2.61	.	.

The most negative residuals are in New England (Vermont, Rhode Island, Massachusetts); the most positive are to the south (West Virginia) and west (Arizona, Nevada); two of these states have no interventions.

The following figure shows all observations along with the best-fitting linear line, sizing the markers to be proportional to the population size; solid (navy blue) markers are for states with interventions, those without have hollow (green) markers.



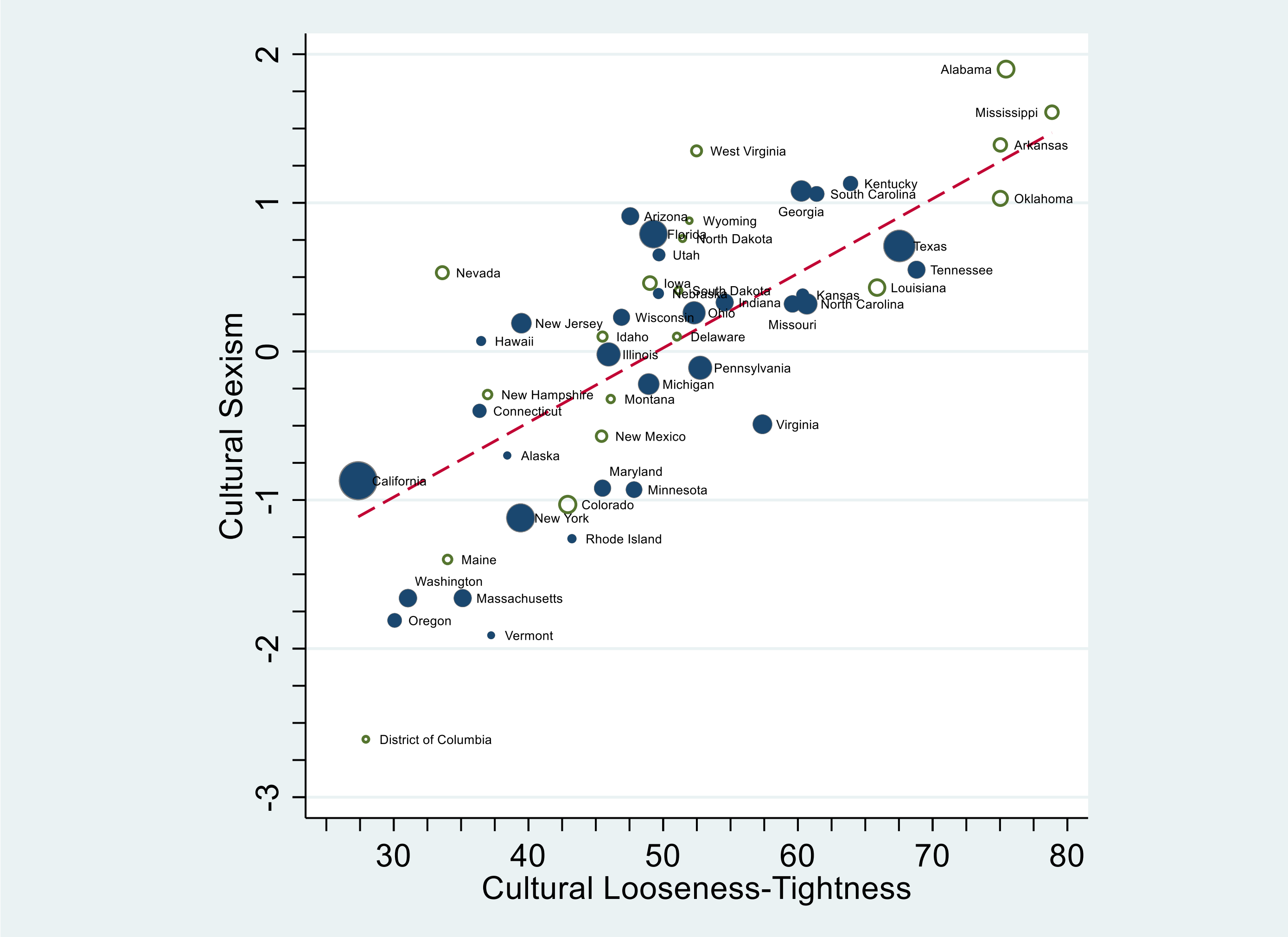
Command:

twoway (lfit csexism loosenessstiffness [aw=pop2010], lpattern(dash) lcolor(cranberry)) (scatter csexism loosenessstiffness [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.25) mcolor(navy)) (scatter csexism loosenessstiffness [aw=pop2010] if hasint==0, mcolor(forest_green) msymbol(Oh) msize(*.25)) (scatter csexism loosenessstiffness, symbol(i) mlabel(postalcode) mlabcolor(black) mlabsize(vsmall)), aspect(1) xtick(25(2.5)80) ytick(-3(.25)2) ytitle(Cultural Sexism) xtitle(Cultural Looseness-Tightness) legend(off)

DC's Looseness-Tightness can be interpolated from its cultural sexism and slaveholding scores:

```
. reg loosenessstiffness pctslaves1860 csexism , b

      Source |       SS           df       MS      Number of obs   =        50
-------------+----------------------------------   F(2, 47)        =     50.37
       Model |  5301.04208         2  2650.52104   Prob > F        =    0.0000
    Residual |  2473.05114        47  52.6181094   R-squared       =    0.6819
-------------+----------------------------------   Adj R-squared   =    0.6683
       Total |  7774.09323        49  158.654964   Root MSE        =    7.2538

------------------------------------------------------------------------------
loosenessst~s |      Coef.   Std. Err.      t    P>|t|                     Beta
--------------+---------------------------------------------------------------
pctslaves1860 |   .2695371   .0690593     3.90   0.000                 .3701247
      csexism |   7.813829   1.284909     6.08   0.000                 .5766907
        _cons |   47.13894   1.205116    39.12   0.000                        .
------------------------------------------------------------------------------

. predict ls_sl_sexism
(option xb assumed; fitted values)

. lis loosenessstiffness csexism ls_hat ls_sl_sexism if postalcode=="DC"

     +---------------------------------------+
     | loosen~s   csexism     ls_hat   ls_sl_~m |
     |---------------------------------------|
  9. |        .     -2.61   16.97957   27.93081 |
     +---------------------------------------+
```

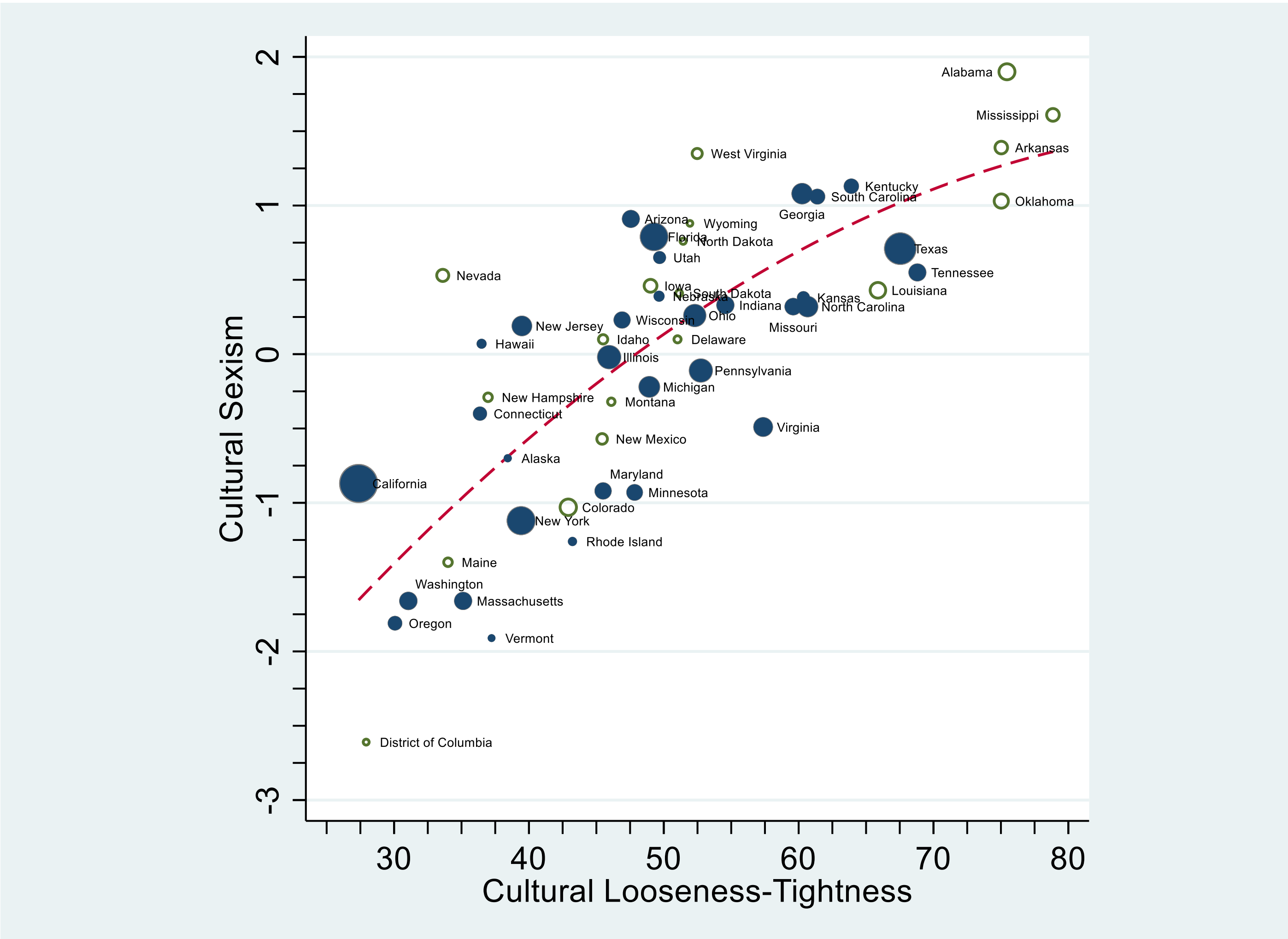
The ls_hat is the predicted value from the regression with just csexism (not shown). Use the ls_sl_sexism estimate as more reasonable and less extreme, now in the variable `ls`.



Command:

```
twoway (lfit csexism ls [aw=pop2010], lpattern(dash) lcolor(cranberry)) (scatter csexism ls [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.25) mcolor(gray)) (scatter csexism ls [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.23) mcolor(navy)) (scatter csexism ls [aw=pop2010] if hasint==0, mcolor(forest_green) msymbol(Oh) msize(*.25)) (scatter csexism ls if hasint==0, symbol(i) mlabel(stname) mlabcolor(black) mlabsize(tiny)) (scatter csexism ls if hasint==1 & (postalcode~="GA" & postalcode~="MO" & postalcode~="WA" & postalcode~="MD"), symbol(i) mlabel(stname) mlabcolor(black) mlabsize(tiny)) (scatter csexism ls if hasint==1 & (postalcode=="GA" | postalcode=="MO"), symbol(i) mlabposition(6) mlabel(stname) mlabcolor(black) mlabsize(tiny)) (scatter csexism ls if hasint==1 & (postalcode=="WA"| postalcode=="MD"), symbol(i) mlabposition(1) mlabel(stname) mlabcolor(black) mlabsize(tiny)) ,  aspect(1) xtick(25(2.5)80) ytick(-3(.25)2) ytitle(Cultural Sexism) xtitle(Cultural Looseness-Tightness) legend(off)
```

If the population weights are removed, a quadratic function can be seen:




```
twoway (qfit csexism ls, lpattern(dash) lcolor(cranberry)) (scatter csexism ls [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.25) mcolor(gray)) (scatter csexism ls [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.23) mcolor(navy)) (scatter csexism ls [aw=pop2010] if hasint==0, mcolor(forest_green) msymbol(Oh) msize(*.25)) (scatter csexism ls if (postalcode~="GA" & postalcode~="MO" & postalcode~="WA" & postalcode~="MD" & postalcode~="MS" & postalcode~="AL"), symbol(i) mlabel(stname) mlabcolor(black) mlabsize(tiny)) (scatter csexism ls if (postalcode=="GA" | postalcode=="MO"), symbol(i) mlabposition(6) mlabel(stname) mlabcolor(black) mlabsize(tiny))  (scatter csexism ls if (postalcode=="WA"| postalcode=="MD"), symbol(i) mlabposition(1) mlabel(stname) mlabcolor(black) mlabsize(tiny)) (scatter csexism ls if (postalcode=="MS"| postalcode=="AL"), symbol(i) mlabposition(9) mlabel(stname) mlabcolor(black) mlabsize(tiny)) ,  aspect(1) xtick(25(2.5)80) ytick(-3(.25)2) ytitle(Cultural Sexism) xtitle(Cultural Looseness-Tightness) legend(off)
```

Technical Summary

State-Level Sex Education

Guttmacher sex education items:

```
. sum cse-sexorientation
```

Variable	Obs	Mean	Std. Dev.	Min	Max
cse	47	.6382979	.4856879	0	1
hiv	47	.8297872	.3798826	0	1
medacc	47	.4255319	.4997687	0	1
contracept~n	44	.4772727	.5052578	0	1
condoms	44	.4545455	.5036862	0	1
abstinence	44	-.6136364	.5376914	-1	1
sexinmarri~e	44	-.4318182	.501056	-1	0
sexorienta~n	44	.1363636	.6321212	-1	1

```
. pwcorr cse-sexorientation
```

	cse	hiv	medacc	contra~n	condoms	abstin~e	sexinm~e
cse	1.0000						
hiv	0.3660	1.0000					
medacc	-0.0686	-0.0682	1.0000				
contracept~n	0.3671	0.2592	0.2082	1.0000			
condoms	0.3320	0.2410	0.3457	0.8640	1.0000		
abstinence	0.1776	0.1563	-0.2151	0.1615	0.1093	1.0000	
sexinmarri~e	0.1870	0.0471	-0.0153	0.2818	0.3351	0.4610	1.0000
sexorienta~n	0.2462	-0.0173	0.0892	0.3012	0.2390	0.3888	0.5574

They make a reasonable scale:

```
. alpha cse-sexorientation

Test scale = mean(unstandardized items)

Average interitem covariance:     .0593777
Number of items in the scale:            8
Scale reliability coefficient:      0.7045
```

And a simple factor analysis suggests one factor.

```
. factor cse-sexorientation
(obs=43)

Factor analysis/correlation                        Number of obs    =         43
    Method: principal factors                      Retained factors =          4
    Rotation: (unrotated)                          Number of params =         26
```

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	2.44439	1.45871	0.6895	0.6895
Factor2	0.98568	0.35411	0.2780	0.9675
Factor3	0.63157	0.55074	0.1782	1.1457
Factor4	0.08083	0.11204	0.0228	1.1685
Factor5	-0.03121	0.10153	-0.0088	1.1597
Factor6	-0.13274	0.05794	-0.0374	1.1223
Factor7	-0.19068	0.05205	-0.0538	1.0685
Factor8	-0.24272	.	-0.0685	1.0000

```
    LR test: independent vs. saturated:  chi2(28) =  117.29 Prob>chi2 = 0.0000

Factor loadings (pattern matrix) and unique variances
```

Variable	Factor1	Factor2	Factor3	Factor4	Uniqueness
cse	0.4530	0.0530	0.3260	0.1726	0.6559
hiv	0.2908	-0.0022	0.4928	0.0493	0.6702
medacc	0.1603	-0.4010	-0.3916	0.1241	0.6447
contracept~n	0.8347	-0.3075	0.0581	-0.0839	0.1982
condoms	0.8349	-0.3981	-0.0428	-0.0606	0.1390
abstinence	0.3860	0.4827	0.0559	-0.0868	0.6073
sexinmarri~e	0.5642	0.4201	-0.2152	-0.0339	0.4578
sexorienta~n	0.5175	0.3994	-0.2729	0.1176	0.4844

If we make the scale the mean of available items, then:

. sum mnsexed

```
   Variable |       Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
    mnsexed |        48    .2560764    .2937476      -.125       .875
```

Of note, there are 3 that have no information. These do not differ on average on either sexism or tightness (see two analyses following).

Technical Summary

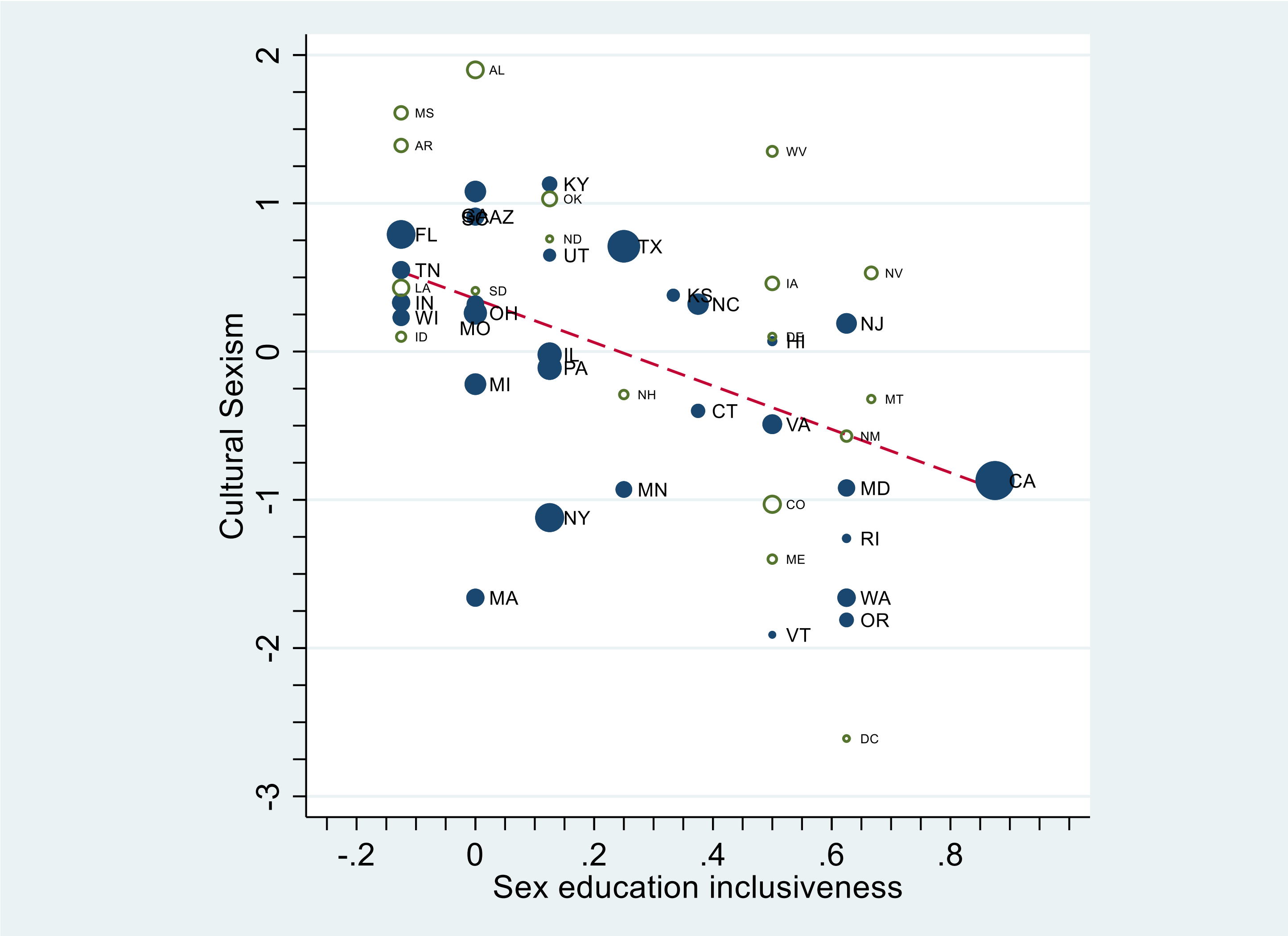
```
. anova csexism nosexedinfo

                 Number of obs =         51    R-squared     =  0.0023
                 Root MSE      =    1.00185    Adj R-squared = -0.0180

          Source | Partial SS         df         MS        F    Prob>F
      -----------+----------------------------------------------------
           Model |  .11459423          1   .11459423      0.11  0.7369
                 |
     nosexedinfo |  .11459423          1   .11459423      0.11  0.7369
                 |
        Residual |  49.181397         49    1.003702
      -----------+----------------------------------------------------
           Total |  49.295991         50   .98591982

. anova ls nosexedinfo

                 Number of obs =         51    R-squared     =  0.0035
                 Root MSE      =    12.9586    Adj R-squared = -0.0168

          Source | Partial SS         df         MS        F    Prob>F
      -----------+----------------------------------------------------
           Model |  29.264415          1   29.264415      0.17  0.6782
                 |
     nosexedinfo |  29.264415          1   29.264415      0.17  0.6782
                 |
        Residual |  8228.3531         49   167.92557
      -----------+----------------------------------------------------
           Total |  8257.6175         50   165.15235
```

Sex education correctness is significantly correlated with the focal variables in question:

```
. pwcorr mnsexed csexism ls pctslaves1860 hasint pop2010, star(.05)

             |  mnsexed  csexism       ls pct~1860   hasint  pop2010
-------------+------------------------------------------------------
     mnsexed |   1.0000 
     csexism |  -0.5544*  1.0000 
          ls |  -0.6085*  0.7750*  1.0000 
pctslav~1860 |  -0.4109*  0.4765*  0.6471*  1.0000 
      hasint |  -0.0702  -0.1948  -0.1447   0.0044   1.0000 
     pop2010 |   0.0061  -0.0190  -0.0404   0.1623   0.4360*  1.0000 
```

It doesn't change much if you weight for pop:

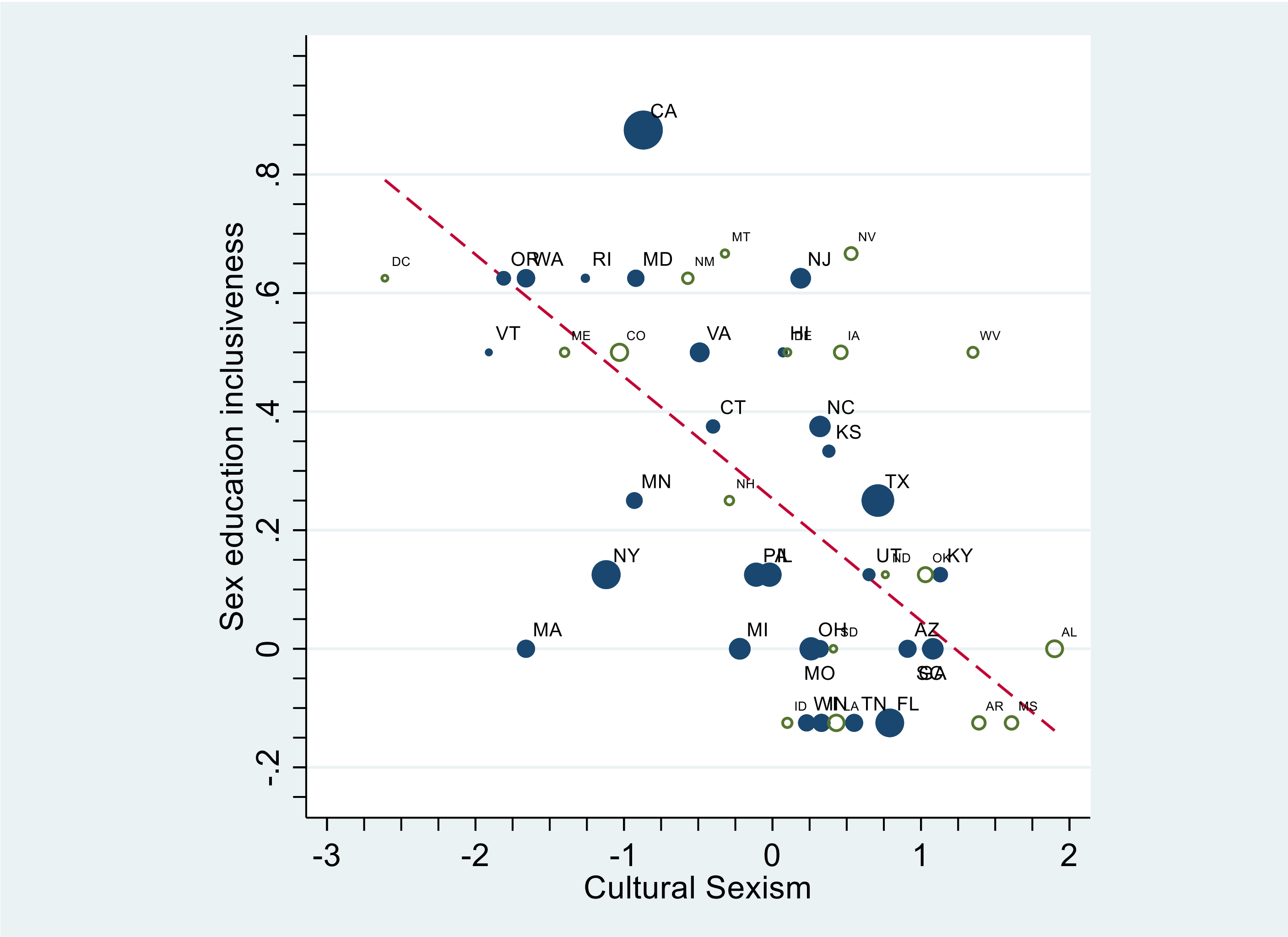
```
. pwcorr mnsexed csexism ls pctslaves1860 hasint pop2010 [aw=pop2010], star(.05)

             |  mnsexed  csexism       ls pct~1860   hasint  pop2010
-------------+------------------------------------------------------
     mnsexed |   1.0000 
     csexism |  -0.5493*  1.0000 
          ls |  -0.6273*  0.7868*  1.0000 
pctslav~1860 |  -0.3842*  0.6203*  0.6418*  1.0000 
      hasint |   0.0352  -0.2285  -0.2333  -0.0718   1.0000 
     pop2010 |   0.4941* -0.2478  -0.4031* -0.0488   0.3801*  1.0000 
```



Command:

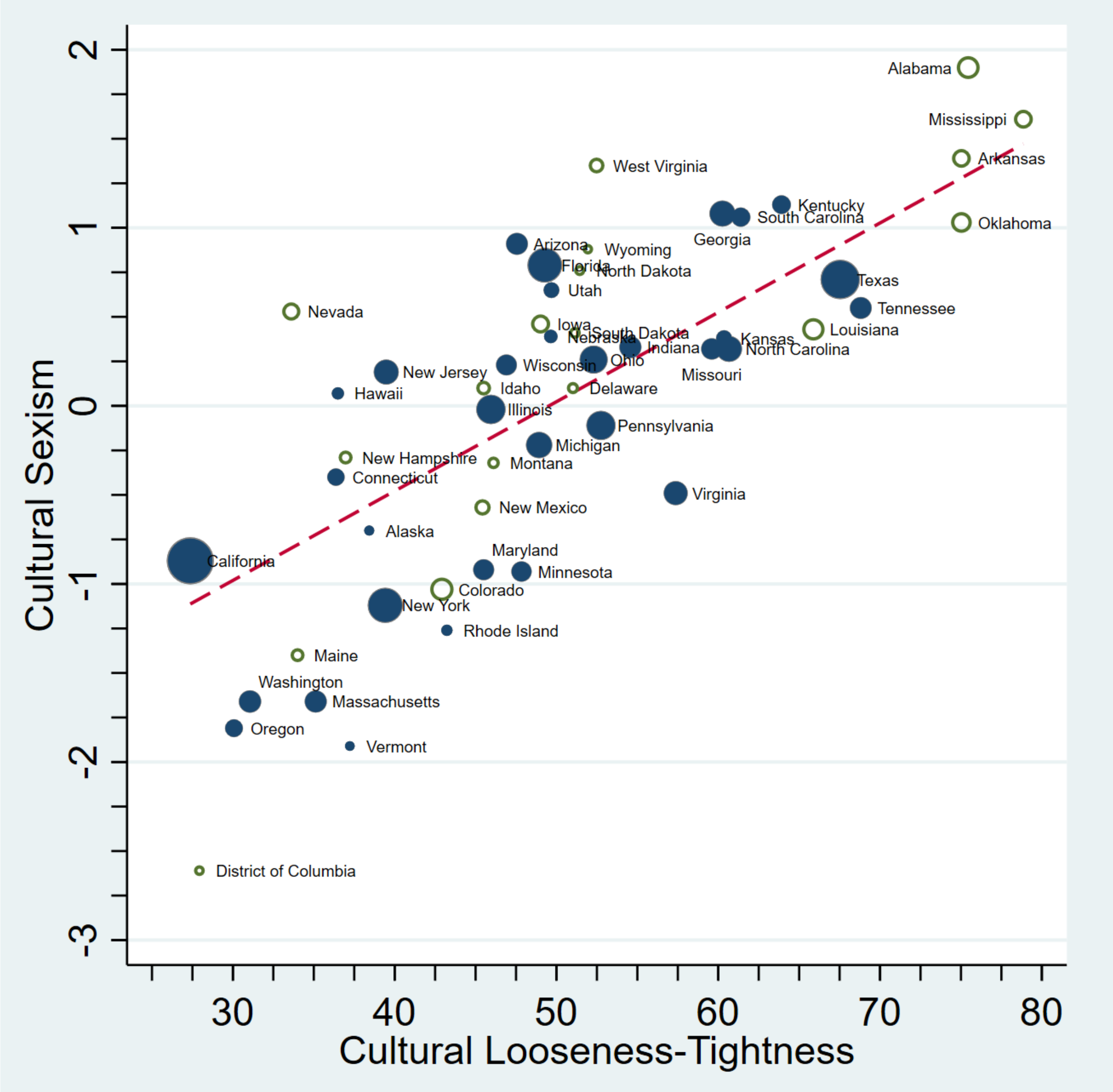
```
twoway (lfit csexism mnsexed [aw=pop2010], lpattern(dash) lcolor(cranberry)) (scatter csexism mnsexed [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.25) mcolor(navy)) (scatter csexism mnsexed [aw=pop2010] if hasint==0, mcolor(forest_green) msymbol(Oh) msize(*.25)) (scatter csexism mnsexed if hasint==0, symbol(i) mlabel(postalcode) mlabcolor(black) mlabsize(tiny)) (scatter csexism mnsexed if hasint==1 & (postalcode~="GA" & postalcode~="SC" & postalcode~="MO"), symbol(i) mlabel(postalcode) mlabcolor(black) mlabsize(vsmall)) (scatter csexism mnsexed if hasint==1 & (postalcode=="GA" | postalcode=="SC" | postalcode=="MO"), symbol(i) mlabposition(6) mlabel(postalcode) mlabcolor(black) mlabsize(vsmall)) , aspect(1) xtick(-.25(.05)1) ytick(-3(.25)2) ytitle(Cultural Sexism) xtitle(Sex education inclusiveness) legend(off)
```

Or rotated:



Command:

twoway (lfit mnsexed csexism [aw=pop2010], lpattern(dash) lcolor(cranberry)) (scatter mnsexed csexism [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.25) mcolor(navy)) (scatter mnsexed csexism [aw=pop2010] if hasint==0, mcolor(forest_green) msymbol(Oh) msize(*.25)) (scatter mnsexed csexism if hasint==0, symbol(i) mlabel(postalcode) mlabposition(1) mlabcolor(black) mlabsize(tiny)) (scatter mnsexed csexism if hasint==1 & (postalcode~="GA" & postalcode~="SC" & postalcode~="MO"), symbol(i) mlabel(postalcode) mlabposition(1) mlabcolor(black) mlabsize(vsmall)) (scatter mnsexed csexism if hasint==1 & (postalcode=="GA" | postalcode=="SC" | postalcode=="MO"), symbol(i) mlabposition(6) mlabel(postalcode) mlabcolor(black) mlabsize(vsmall)) , aspect(1) ytick(-.25(.05)1) xtick(-3(.25)2) xtitle(Cultural Sexism) ytitle(Sex education inclusiveness) legend(off)



Command:

twoway (lfit csexism ls [aw=pop2010], lpattern(dash) lcolor(cranberry)) (scatter csexism ls [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.25) mcolor(gray)) (scatter csexism ls [aw=pop2010] if hasint==1 , msymbol(O) mcolor(navy) msize(*.23) mcolor(navy)) (scatter csexism ls [aw=pop2010] if hasint==0, mcolor(forest_green) msymbol(Oh) msize(*.25)) (scatter csexism ls if (postalcode~="GA" & postalcode~="MO" & postalcode~="WA" & postalcode~="MD" & postalcode~="MS" & postalcode~="AL"), symbol(i) mlabel(stname) mlabcolor(black) mlabsize(tiny)) (scatter csexism ls if (postalcode=="GA" | postalcode=="MO"), symbol(i) mlabposition(6) mlabel(stname) mlabcolor(black) mlabsize(tiny)) (scatter csexism ls if (postalcode=="WA"| postalcode=="MD"), symbol(i) mlabposition(1) mlabel(stname) mlabcolor(black) mlabsize(tiny)) (scatter csexism ls if (postalcode=="MS"| postalcode=="AL"), symbol(i) mlabposition(9) mlabel(stname) mlabcolor(black) mlabsize(tiny)) , aspect(1) xtick(25(2.5)80) ytick(-3(.25)2) ytitle(Cultural Sexism) xtitle(Cultural Looseness-Tightness) legend(off)

Technical Summary

Inclusiveness is related to sexism whether without (first) or with population weighting (second):

```
. reg mnsexed csexism , b

      Source |       SS           df       MS      Number of obs   =        48
-------------+----------------------------------   F(1, 46)        =     20.41
       Model |  1.24653238         1  1.24653238   Prob > F        =    0.0000
    Residual |  2.80898704        46  .061064936   R-squared       =    0.3074
-------------+----------------------------------   Adj R-squared   =    0.2923
       Total |  4.05551942        47  .086287647   Root MSE        =    .24711

------------------------------------------------------------------------------
     mnsexed |      Coef.   Std. Err.      t    P>|t|                     Beta
-------------+----------------------------------------------------------------
     csexism |  -.1613636   .0357149    -4.52   0.000                -.5544068
       _cons |   .2542274   .0356701     7.13   0.000                        .
------------------------------------------------------------------------------

. reg mnsexed csexism [aw=pop2010], b
(sum of wgt is 305,645,340)

      Source |       SS           df       MS      Number of obs   =        48
-------------+----------------------------------   F(1, 46)        =     19.88
       Model |  1.53605535         1  1.53605535   Prob > F        =    0.0001
    Residual |  3.55499522        46  .077282505   R-squared       =    0.3017
-------------+----------------------------------   Adj R-squared   =    0.2865
       Total |  5.09105057        47  .108320225   Root MSE        =      .278

------------------------------------------------------------------------------
     mnsexed |      Coef.   Std. Err.      t    P>|t|                     Beta
-------------+----------------------------------------------------------------
     csexism |  -.2059436    .046194    -4.46   0.000                -.5492875
       _cons |    .253255   .0401394     6.31   0.000                        .
------------------------------------------------------------------------------
```

Lifetime Intimate Sexual Violence

We used CDC data from the 2010-2012 State Report to document lifetime intimate partner violence data by gender, which was available for 49 of 51 states. An odds ratio was defined to document this tendency, which across states generally meant that females experienced more than did males.

```
. sum oripvgender

    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
 oripvgender |         49    1.453032    .5007297   .7221897    3.36762
```

Technical Summary

Those missing data were two states low in cultural sexism.

```
. anova csexism noipv

                         Number of obs =         51    R-squared     =  0.2158
                         Root MSE      =    .888247    Adj R-squared =  0.1997

                  Source | Partial SS         df         MS        F    Prob>F
              -----------+----------------------------------------------------
                   Model |  10.635836          1  10.635836     13.48  0.0006
                         |
                   noipv |  10.635836          1  10.635836     13.48  0.0006
                         |
                Residual |  38.660154         49  .78898274
              -----------+----------------------------------------------------
                   Total |  49.295991         50  .98591982

. tab noipv, sum(csexism)

            |          Summary of csexism
      noipv |        Mean   Std. Dev.       Freq.
------------+------------------------------------
          0 |   .09265306   .89460366          49
          1 |  -2.2599999    .4949747           2
------------+------------------------------------
      Total |   .00039216   .99293495          51


. lis state if noipv ==1

     +----------------------+
     |                state |
     |----------------------|
  9. | DISTRICT OF COLUMBIA |
 46. |              VERMONT |
     +----------------------+
```

These two were also relatively loose states, although not markedly different:

```
. anova ls noipv

                         Number of obs =         51    R-squared     =  0.0739
                         Root MSE      =    12.4927    Adj R-squared =  0.0550

                  Source | Partial SS         df         MS        F    Prob>F
              -----------+----------------------------------------------------
                   Model |   610.3247          1   610.3247      3.91  0.0536
                         |
                   noipv |   610.3247          1   610.3247      3.91  0.0536
                         |
                Residual |  7647.2928         49   156.0672
              -----------+----------------------------------------------------
                   Total |  8257.6175         50  165.15235

. tab noipv, sum(ls)

            |            Summary of ls
      noipv |        Mean   Std. Dev.       Freq.
------------+------------------------------------
          0 |   50.402244   12.586414          49
          1 |   32.580405   6.5755193           2
------------+------------------------------------
      Total |   49.703349   12.851161          51
```

Technical Summary

```
. pwcorr oripvgender csexism ls pctslaves1860 mnsexed hasint pop2010 [aw=pop2010], star(.05)
```

	oripvg~r	csexism	ls	pct~1860	mnsexed	hasint	pop2010
oripvgender	1.0000						
csexism	0.1538	1.0000					
ls	0.1405	0.7868*	1.0000				
pctslav~1860	0.2052	0.6203*	0.6418*	1.0000			
mnsexed	-0.1227	-0.5493*	-0.6273*	-0.3842*	1.0000		
hasint	0.1686	-0.2285	-0.2333	-0.0718	0.0352	1.0000	
pop2010	-0.3047*	-0.2478	-0.4031*	-0.0488	0.4941*	0.3801*	1.0000

Intimate partner violence was uncorrelated with the primary variables of this study.

Mean levels reporting lifetime sexual violence were also not correlated.

```
. sum lifesexvio
```

Variable	Obs	Mean	Std. Dev.	Min	Max
lifesexvio	51	37.05098	3.909341	29.5	47.5

```
. pwcorr lifesexvio oripvgender csexism ls pctslaves1860 mnsexed hasint pop2010 [aw=pop2010], star(.05)
```

	lifese~o	oripvg~r	csexism	ls	pct~1860	mnsexed	hasint
lifesexvio	1.0000						
oripvgender	-0.0039	1.0000					
csexism	-0.2496	0.1538	1.0000				
ls	-0.1366	0.1405	0.7868*	1.0000			
pctslav~1860	-0.3375*	0.2052	0.6203*	0.6418*	1.0000		
mnsexed	0.0972	-0.1227	-0.5493*	-0.6273*	-0.3842*	1.0000	
hasint	0.1411	0.1686	-0.2285	-0.2333	-0.0718	0.0352	1.0000
pop2010	-0.2450	-0.3047*	-0.2478	-0.4031*	-0.0488	0.4941*	0.3801*

Variables State by State

```
. lis stname-gini , clean
```

	stname	postal~e	stfips	csexism	hasint	ls_rank	loosen~s	pop2010	ginirank	gini
1.	Alabama	AL	1	1.9	0	2	75.45	4.8e+06	45	.4847
2.	Alaska	AK	2	-.7	1	40	38.43	710231	2	.4081
3.	Arizona	AZ	4	.91	1	29	47.56	6.4e+06	31	.4713
4.	Arkansas	AR	5	1.39	0	3	75.03	2.9e+06	32	.4719
5.	California	CA	6	-.87	1	50	27.37	3.7e+07	48	.4899
6.	Colorado	CO	8	-1.03	0	37	42.92	5.0e+06	21	.4586
7.	Connecticut	CT	9	-.4	1	44	36.37	3.6e+06	49	.4945
8.	Delaware	DE	10	.1	0	22	51.02	897934	14	.4522
9.	District of Columbia	DC	11	-2.61	0	.	.	601723	52	.542
10.	Florida	FL	12	.79	1	25	49.28	1.9e+07	46	.4852
11.	Georgia	GA	13	1.08	1	12	60.26	9.7e+06	43	.4813
12.	Hawaii	HI	15	.07	1	43	36.49	1.4e+06	5	.442
13.	Idaho	ID	16	.1	0	33	45.5	1.6e+06	12	.4503
14.	Illinois	IL	17	-.02	1	32	45.95	1.3e+07	40	.481
15.	Indiana	IN	18	.33	1	15	54.57	6.5e+06	15	.4527
16.	Iowa	IA	19	.46	0	26	49.02	3.0e+06	6	.4451
17.	Kansas	KS	20	.38	1	11	60.36	2.9e+06	18	.455
18.	Kentucky	KY	21	1.13	1	8	63.91	4.3e+06	42	.4813
19.	Louisiana	LA	22	.43	0	7	65.88	4.5e+06	50	.499
20.	Maine	ME	23	-1.4	0	46	34	1.3e+06	13	.4519
21.	Maryland	MD	24	-.92	1	34	45.5	5.8e+06	11	.4499
22.	Massachusetts	MA	25	-1.66	1	45	35.12	6.5e+06	37	.4786
23.	Michigan	MI	26	-.22	1	27	48.93	9.9e+06	28	.4695
24.	Minnesota	MN	27	-.93	1	28	47.84	5.3e+06	9	.4496
25.	Mississippi	MS	28	1.61	0	1	78.86	3.0e+06	44	.4828
26.	Missouri	MO	29	.32	1	13	59.6	6.0e+06	24	.4646
27.	Montana	MT	30	-.32	0	31	46.11	989415	25	.4667
28.	Nebraska	NE	31	.39	1	24	49.65	1.8e+06	7	.4477
29.	Nevada	NV	32	.53	0	47	33.61	2.7e+06	19	.4577
30.	New Hampshire	NH	33	-.29	0	42	36.97	1.3e+06	3	.4304
31.	New Jersey	NJ	34	.19	1	38	39.48	8.8e+06	41	.4813
32.	New Mexico	NM	35	-.57	0	35	45.43	2.1e+06	34	.4769
33.	New York	NY	36	-1.12	1	39	39.42	1.9e+07	51	.5229
34.	North Carolina	NC	37	.32	1	10	60.67	9.5e+06	35	.478
35.	North Dakota	ND	38	.76	0	20	51.44	672591	16	.4533
36.	Ohio	OH	39	.26	1	18	52.3	1.2e+07	26	.468
37.	Oklahoma	OK	40	1.03	0	4	75.03	3.8e+06	23	.4645
38.	Oregon	OR	41	-1.81	1	49	30.07	3.8e+06	20	.4583
39.	Pennsylvania	PA	42	-.11	1	16	52.75	1.3e+07	27	.4689
40.	Rhode Island	RI	44	-1.26	1	36	43.23	1.1e+06	36	.4781
41.	South Carolina	SC	45	1.06	1	9	61.39	4.6e+06	33	.4735
42.	South Dakota	SD	46	.41	0	21	51.14	814180	8	.4495
43.	Tennessee	TN	47	.55	1	5	68.81	6.3e+06	38	.479
44.	Texas	TX	48	.71	1	6	67.54	2.5e+07	39	.48
45.	Utah	UT	49	.65	1	23	49.69	2.8e+06	1	.4063
46.	Vermont	VT	50	-1.91	1	41	37.23	625741	17	.4539
47.	Virginia	VA	51	-.49	1	14	57.37	8.0e+06	29	.4705
48.	Washington	WA	53	-1.66	1	48	31.06	6.7e+06	22	.4591
49.	West Virginia	WV	54	1.35	0	17	52.48	1.9e+06	30	.4711
50.	Wisconsin	WI	55	.23	1	30	46.91	5.7e+06	10	.4498
51.	Wyoming	WY	56	.88	0	19	51.94	563626	4	.436

```
. lis csexloosehat - ls_sl_sexism , clean
```

	csexloo~t	csexloo~s	ls_hat	ls	lcislr	ucislr	st_terr1860	pop1860	free1860	sla~1860	pct~1860	ls_sl_~m
1.	1.294576	.6054239	72.93412	75.45	.4567568	.754091	Alabama	964201	529121	435080	45.1	74.14134
2.	-.5507428	-.1492572	40.67651	38.43	-.2979243	-.00059		.	.		0	41.66926
3.	-.0956438	1.005644	60.65142	47.56	.8569767	1.154311		.	.		0	54.24953
4.	1.273641	.1163594	66.60667	75.03	-.0323077	.2650265	Arkansas	435450	324335	111115	25.5	64.87336
5.	-1.102046	.2320456	38.56736	27.37	.0833785	.3807127	California	379994	379994	0	0	40.34091
6.	-.326932	-.703068	36.58228	42.92	-.8517351	-.5544009	Colorado Territory	34277	34277	0	0	39.0907
7.	-.6534268	.2534268	44.39854	36.37	.1047597	.4020939	Connecticut	460147	460147	0	0	44.01341
8.	.0768252	.0231748	50.60193	51.02	-.1254923	.1718419	Delaware	112216	110418	1798	1.6	48.35159
9.	.	.	16.97957	27.93081	.	.	District of Columbia	75080	71985	3185	4.4	27.93081
10.	-.0099079	.7999079	59.1626	49.28	.6512408	.948575	Florida	140424	78679	61745	44	65.1715
11.	.5374072	.5425929	62.76057	60.26	.3939258	.69126	Georgia	1.1e+06	595088	462198	43.7	67.35665
12.	-.6474451	.7174451	50.22972	36.49	.568778	.8661122		.	.		0	47.68591
13.	-.1983278	.2983278	50.60193	45.5	.1496607	.4469949		.	.		0	47.92033
14.	-.1758968	.1558968	49.11311	45.95	.0072297	.3045639	Illinois	1.7e+06	1.7e+06	0	0	46.98267
15.	.2537804	.0762196	53.45549	54.57	-.0724475	.2248868	Indiana	1.4e+06	1.4e+06	0	0	49.71751
16.	-.0228679	.4828679	55.06837	49.02	.3342008	.6315351	Iowa	674913	674913	0	0	50.7333
17.	.5423919	-.1623919	54.07582	60.36	-.311059	-.0137248	Kansas Territory	107206	107204	2	.01	50.11089
18.	.7193471	.4106529	63.38091	63.91	.2619858	.55932	Kentucky	1.2e+06	930201	225483	19.5	61.22454
19.	.8175446	-.3875447	54.69616	65.88	-.5362118	-.2388775	Louisiana	708002	376276	331726	46.9	63.14018
20.	-.7715631	-.6284369	31.99177	34	-.777104	-.4797698	Maine	628279	628279	0	0	36.19958
21.	-.1983278	-.7216722	37.94702	45.5	-.8703393	-.5730051	Maryland	687049	599860	87189	12.7	43.37334
22.	-.715735	-.944265	28.76601	35.12	-1.092932	-.7955979	Massachusetts	1.2e+06	1.2e+06	0	0	34.16799
23.	-.0273541	-.1926459	46.63176	48.93	-.341313	-.0439788	Michigan	749113	749113	0	0	45.4199
24.	-.0816869	-.8483132	37.82295	47.84	-.9969802	-.6996461	Minnesota	172023	172023	0	0	39.87208
25.	1.464553	.145447	69.33616	78.86	-.0032201	.2941142	Mississippi	791305	354674	436631	55.2	74.59766
26.	.5045084	-.1845084	53.33142	59.6	-.3331755	-.0358413	Missouri	1.2e+06	1.1e+06	114931	9.7	52.25388
27.	-.1679214	-.1520786	45.39108	46.11	-.3007458	-.0034115		.	.		0	44.63852
28.	.0085355	.3814645	54.19989	49.65	.2327974	.5301316	Nebraska Territory	28841	28826	15	.01	50.18903
29.	-.7910032	1.321003	55.93684	33.61	1.172336	1.46967	Nevada Territory	6848	6857	0	0	51.28027
30.	-.6235188	.3335187	45.76329	36.97	.1848516	.4821859	New Hampshire	326064	326073	0	0	44.87293
31.	-.498404	.688404	51.71854	39.48	.5397369	.8370711	New Jersey	672035	672017	18	.01	48.62627
32.	-.201817	-.368183	42.28939	45.43	-.5168501	-.2195158	New Mexico Territory	93514	93514	0	0	42.68506
33.	-.5013949	-.6186051	35.46566	39.42	-.7672722	-.469938	New York	3.9e+06	3.9e+06	0	0	38.38745
34.	.5578442	-.2378442	53.33142	60.67	-.3865113	-.0891771	North Carolina	992622	661563	331059	33.4	58.64191
35.	.0977606	.6622394	58.7904	51.44	.5135723	.8109065		.	.		0	53.07745
36.	.1406287	.1193713	52.58701	52.3	-.0292958	.2680384	Ohio	2.3e+06	2.3e+06	0	0	49.17054
37.	1.273641	-.2436406	62.14023	75.03	-.3923078	-.0949735		.	.		0	55.18719
38.	-.96746	-.84254	26.90499	30.07	-.9912071	-.6938729	Oregon	52465	52465	0	0	32.99591
39.	.1630597	-.2730597	47.99651	52.75	-.4217268	-.1243925	Pennsylvania	2.9e+06	2.9e+06	0	0	46.27942
40.	-.3114794	-.9485205	33.72871	43.23	-1.097188	-.7998534	Rhode Island	174620	174620	0	0	37.29352
41.	.5937338	.4662662	62.51243	61.39	.317599	.6149333	South Carolina	703708	301302	402406	57.2	70.83913
42.	.0828067	.3271933	54.44803	51.14	.1785262	.4758604		.	.		0	50.34261
43.	.963595	-.4135951	56.18497	68.81	-.5622622	-.2649279	Tennessee	1.1e+06	834082	275719	24.8	58.12107
44.	.9002901	-.1902901	58.17006	67.54	-.3389573	-.041623	Texas	604215	421649	182566	30.2	60.82678
45.	.0105292	.6394708	57.42565	49.69	.4908037	.7881379	Utah Territory	40273	40184	89	.01	52.22063
46.	-.6105587	-1.299441	25.66431	37.23	-1.448108	-1.150774	Vermont	315098	315098	0	0	32.21453
47.	.3933507	-.8833507	43.28193	57.37	-1.032018	-.7346836	Virginia	1.6e+06	1.1e+06	490865	30.7	51.58495
48.	-.9181119	-.741888	28.76601	31.06	-.8905551	-.5932209	Washington Territory	11594	11594	0	0	34.16799
49.	.1496011	1.200399	66.1104	52.48	1.051732	1.349066		.	.		0	57.68761
50.	-.1280442	.3580442	52.21481	46.91	.2093771	.5067113	Wisconsin	775881	775881	0	0	48.93612
51.	.1226839	.7573161	60.27921	51.94	.608649	.9059832		.	.		0	54.01511

Commentary Text

NB. For final text, see article in Clinical Psychology: Science and Practice (CP:SP), published in 2021. Below is the text submitted to the journal for the article titled, "Divining Structural Factors Related to Intervention Success or Failure: Cultural Sexism versus Other Macro-Level Factors."

As the samples of interventions examined by meta-analyses grow, opportunities grow not just to see whether the interventions succeed but also to understand better what factors may contribute to intervention success (and failure). Early meta-analysts focused mainly on factors assessed directly within the interventions themselves—factors such as population targeted, specific active content, dosage of content, and time lapse at the point of measurement—viz. *micro-level* factors. Drawing on increasingly more sophisticated conceptual and statistical models, more recent meta-analysts have begun isolating environmental and structural factors—viz. *macro-level factors*—that may facilitate or inhibit intervention success. Macro-level factors can vary widely across a plethora of possible dimensions, ranging from environmental factors (e.g., pollution, meteorological events) to psychosocial aspects such as intergroup prejudice. The prejudice and discrimination that minorities routinely face, for example, may impede the success of health promotion interventions for such groups. Ecological models are especially germane to thinking about how best to improve individuals' welfare, concentrating on interacting and reciprocal circles of influence that range from intrapsychic to social to societal, micro to macro. Because psychosocial interventions target individuals who subsequently must live in the same environment that plausibly caused the risky or unhealthy profile in the first place, a greater focus on the supportiveness of macro-level actors would seem crucial.

In this context, Price and colleagues' (in press) recent spatial meta-analysis examined whether the efficacy of psychotherapy for girls might depend on how supportive the cultural milieu is where the therapy took place. Included were 93 therapeutic intervention studies conducted in the United States whose samples included a majority of girls aged four- to 18-years old. The studies were carried out between 1966 and 2017, although most were conducted since the 1990s; they took place in 32 of the 50 states (64%; there were none in the District of Columbia [DC]). This team utilized secondary data sources comprised of online surveys that evaluate attitudes toward women and men, either directly or indirectly, to gauge the degree of *cultural sexism* present in each state, and where feasible at the county level. Positive scores are related to greater traditional attitudes or social norms toward women and their gender roles in society, which equates with a normative tendency for both women and men to view women as having less important social roles, status, and opportunities. Negative scores were coded relative to the nation-level mean and indicate less traditional attitudes or more egalitarian social norms toward women.

Provocatively, in focused analyses, Price et al. (in press) found support for their hypothesis: Over and above micro-level factors examined (e.g., whether an active control was included, mental health problem targeted), psychotherapy interventions conducted in states with lower cultural sexism levels succeeded better than did those conducted in states with higher cultural sexism. In turn, the current article discusses the meaning of cultural sexism and explores other macro-level factors that may also be implicated. A major problem in meta-analysis is that moderator dimensions are almost always correlational and thus investigators must be sophisticated to examine whether alternative factors might be better explanations. To do so, investigators examine multiple-moderator models to statistically control the potential confounders and thus divine what factors are uniquely associated with variation in effect sizes.

Understanding Cultural Sexism

That levels of cultural sexism as modeled by Price et al. (in press) range so widely across areas in the U.S. is suggestive that attitudes toward women, social roles, gender stereotypes, and gender equality also vary considerably. Price et al. modeled cultural sexism based upon implicit and explicit attitude data, calculating an attitude range that may or may not approximate experienced cultural sexism. Self-reported attitudes may be impacted by rationalization, system justification, and other social desirability biases. Indeed, although implicit attitude scores were strongly correlated with explicit attitudes factored into the cultural sexism construct, implicit attitudes were not as markedly correlated with intervention effect sizes. It should be emphasized that the zero point on Price et al.'s cultural sexism scale represents the average score across the U.S., such that positive scores were above average and negative scores were below it. The mean value of zero probably does *not* reflect a true neutral point; instead, the U.S. as a whole is culturally sexist, such that even in states with low cultural sexism, girls and women nevertheless experience some amount of cultural sexism. As evidence, consider rampant media objectification of women, including broadcast media, advertising, music, and, social media, which has been shown to influence lower self-esteem, distorted body image, and poorer mental health outcomes for adolescent girls (Grabe & Hyde, 2009); as well, large percentages of women report experiencing sexual violence in their lifetimes, even in so-called low sexism states (Smith et al., 2017). Nonetheless, we strongly suspect that the range of cultural sexism values that Price et al. documented is real.

In concurrence with Price et al.'s (in press) broader theoretical model emphasizing cultural sexism, we theorize that cultural tightness-looseness is also related to therapeutic success for intervention studies. Cultures have been shown to vary meaningfully in terms of *tightness*—many strongly enforced rules and little tolerance for deviance—versus the reverse, *looseness*—few strongly enforced rules and more tolerance for deviance (e.g., Harrington & Gelfand, 2014). According to this ecological model, naturalistic or human-made threats increase a culture's need to enforce strong norms so that members can coordinate socially and survive—whether it is to reduce chaos in areas with high population density, to ameliorate resource scarcity, to coordinate against natural disasters, to fend off territorial threats, or to stop the spread of disease. Harrington and Gelfand created a state-level index of tightness-looseness based on documented practices in each state, such as whether corporal punishment was legal in schools, how severely violations of criminal statutes were punished, how religious a state is, and the ratio of foreigners in its population. None of the practices in their scale directly tracks sexism, but one item does so indirectly, support for same-sex marriage. To characterize the extremes of this index, the four loosest states were California, Oregon, Washington, and DC, and the four tightest were Mississippi, Alabama, Oklahoma, and Arkansas; around the mid-point were Minnesota, Michigan, Iowa, and Florida. We thus hypothesized that states with higher cultural sexism also are tighter and that states with lower cultural sexism are looser, expanding on Harrington and Gelfand's findings that tightness and tolerance of gender inequality are correlated.

Accordingly, we created a database with Price et al.'s (in press) values for cultural sexism combined along with other state-level factors, such as tightness, history of slaveholding, sex education inclusiveness, and several control variables (e.g., population taken in the 2010 census). The results we present here are the same whether we weight analyses by state population (or not), even though states with interventions were over three times more populous than those without interventions, $F(1, 49)=11.50$, $p=.0014$, $R^2=0.19$. (Still, this result helps to show that interventions took place in relatively populous areas as opposed to more rural environments. Urban communities often operate differently than do rural ones, a factor that bears further consideration in future meta-analyses of intervention studies.) Further results report the weighted versions.

As we hypothesized, tighter states were much more likely to have higher levels of cultural sexism, $r(49)=.79$, $p<.0001$, a very large effect size. Thus, states with high cultural sexism were likely to be high in tightness, as well, such as Texas, Kentucky, and Tennessee, although the four states with the highest cultural sexism had no interventions (Mississippi, Alabama, Arkansas, West Virginia). On the other end of the cultural sexism continuum, of the five states with lowest values, DC, Vermont, Oregon, Massachusetts, and Washington, all had interventions except DC; these can all be characterized as quite culturally flexible, "loose" to "very loose."

Technical Summary

Given that communities characterized by negative attitudes and stereotypes regarding one minority group tend to have similarly negative views of other minority groups, we were led to posit that more sexist cultures may also hold negative racial views. Payne and colleagues (2019) showed that the degree to which U.S. counties held slaves, as documented in the 1860 U.S. census, was markedly associated with the extent to which Whites' attitudes were negative attitudes toward Blacks (r=.64, p<.001), as gauged in one of Price et al.'s main data sources, Project Implicit. Logically, racism has persisted across a century and a half because of factors associated with slaveholding and its aftermath (e.g., redlining, residential segregation, cultural traditions). Our analysis revealed that this same variable, 1860 slaveholding at the state level, also markedly associates with Price et al.'s cultural sexism values, r(49)=.63, p<.001, again a large effect size. Hence, yet another factor appears plausibly associated with U.S. clinical intervention success for girls, although because we did not have access to Price et al.'s effect size data we could not make a formal test. Gender and race are frequently linked in contemporary treatments of intersectionality; thus, macro-level factors may well be baked into the societal mix.

Because Price et al.'s (in press) attitudinal index of cultural sexism aligns so closely with the tightness-looseness index, which is based on more formal variables, community attitudes and norms may be intertwined with policies within individual states, including laws and enforcement of those laws. Yet, because this work is correlational, it is important to note that causality may reverse: Attitudes can conform to local policies after the fact, perhaps because preservation of the status quo in tighter states may block changes in social norms toward greater gender equality. A more idealistic perspective is that networks of individuals develop attitudes supportive of gender equity and that these attitudes then drive political change that institutionalizes equitable treatment under the law. Either way, cultural sexism would seem to be much more interwoven into the fabric of other dimensions than its label would indicate.

The range of culturally sexist attitudes that Price et al. (in press) documented also may be associated with state-level sex education mandates and specific required components of the curriculum. Research evaluating sex education in the United States and other nations over the past 30 years has found that comprehensive sex education—especially when required to be medically accurate and include curricula such as birth control, safe sex, consent, refusal, boundaries, healthy relationships, and sexual decision-making, as opposed to focusing primarily on abstinence, preventing pregnancy and sex only in marriage—is not only associated with lower rates of intimate partner violence, unwanted pregnancies, and sexually transmitted infections but also is associated with better socio-emotional learning, interpersonal skills and self-esteem for adolescent girls (Goldfarb & Lieberman, 2020). Although not specifically examined in the studies reviewed, the connection between these latter influences and the psychological health of young girls is well-established in the literature. We compiled an index of sex education inclusiveness, aggregating the various components of sex education curriculum such as contraception, healthy relationships, refusal, and consent—from the Guttmacher Institute's (2021) extensive review of state-level mandates. States with higher more cultural sexism also had less inclusive curricula, $r(46)=-.55$, $p<.001$. (The same association emerged with cultural tightness, $r(46)=-.63$, $p<.001$.)

A puzzle from Price et al.'s (in press) results is that, although state-level cultural sexism was associated with intervention efficacy for adolescent girls, the same pattern did not emerge with county-level cultural sexism as a predictor (although interaction effects did, such as less intervention success in states where both county level and state level cultural sexism were high). On the face of it, this finding appears to contradict the *first law of geography*, that more proximal factors have a greater influence on outcomes than those farther away. Yet, we posit that this finding reflects the practical difficulties of more micro factors countering state-level mandates effectively. For example, in Mississippi, a state that is both culturally tight and culturally sexist, localities may include only instruction about contraception and prevention of sexually transmitted infections when they have the express permission of the state-level Department of Education. Similarly, in Utah, teachers are prohibited from answering student questions with information that might conflict with state sex education laws, which must stress abstinence and that sexual intercourse takes place only in marriage.

The same conclusion emerges from another marker of cultural sexism, the protection—or lack thereof—of women who have been victims of sexual violence or intimate partner assault. This factor is also dependent on state-level laws. Thus, the four tightest states—Alabama, Arkansas, Mississippi, and Oklahoma, which scored high on cultural sexism and lacked studies evaluating psychotherapy interventions for girls—also have no employment rights laws providing intimate partner violence victims with leave from work or broader protections against employment discrimination related to the violence (statusofwomendata.org, 2021). These states also elevate protecting gun rights over protecting women from future violence, failing to enact laws to prohibit gun possession by persons convicted of domestic or sexual violence, or subject to domestic violence protective orders, and do not require removal of firearms from such individuals. One would be hard-pressed to envision county-level efforts that could ameliorate state-level policy decisions such as these. Hence, even when localities are less sexist (e.g., teachers, health-care providers, government officials), their views can run afoul of a more powerful network, which in turn squelches efforts to act differently. Similarly, major social norm changes, such as recognition of same-sex marriage, although effectuated through some state-level policy changes, remained scattershot until the U.S. Supreme Court decision in *Obergefell v. Hodges (2015)* 135 S.Ct. 2071, 576 U.S. 644, permitted same-sex marriages as the law of the land.

Finally, at their most potent, media both traditional and social easily cut across traditional spatial boundaries; real or imagined events broadcast swiftly through networks and can harm networks of related individuals such as sexual minorities. By the same token, some actions—such as promoting social clubs for stigmatized individuals—have been shown to create resilience in affected adolescents. As an example, Hatzenbuehler and colleagues (2019) documented that homophobic bullying of school children increased in California after a state-wide referendum restricted marriage to heterosexuals; importantly, this pattern was restricted to schools where there were no gay-straight alliances. Thus, allies across social lines could help ameliorate an important problem.

Concluding Remarks

Price and colleagues (in press) have provided valuable preliminary evidence that a dimension of cultural sexism can countervail efforts for psychotherapy to succeed in samples that focus on girls aged four to 18. Our own examination reveals cultural sexism to be associated with at least three macro-level factors: cultural tightness, historical slaveholding (and by implication racism), and sex education inclusiveness. The fact that cultural sexism can be so well predicted by these factors is additional evidence that cultural sexism is real, yet it also suggests caution in interpreting these effects as merely reflecting cultural sexism. Surely, the reality is more complex. Thus, we believe that understanding effects of interventions at the macro level requires a more extensive model, one that incorporates objective measures of sexism beyond markers such as income, income inequality, poverty, and education, and meaningfully theorizes about how such dimensions might interact. For example, sexism is logically more pernicious to the extent that a culture is tight; nation-level changes such as same-sex marriage would seem to have considerable potential to improve mental health for affected individuals; finally, media avenues also are a potentially extremely powerful force as these easily cross artificial spatial boundaries. Our findings further suggest that understanding the structural policy components of cultural sexism, of which this essay is merely a beginning, could inform future interventions to improve the psychological health outcomes for adolescent girls. Along these lines, the same meta-analytic framework could be used to assess the success of psychotherapy interventions not only for girls but also boys and others, especially those at the intersection of stigmatized identities (e.g., sexual minorities of color). The results from such models promise to point the way to improved therapies.

As a final note, consider again that all of the factors we have discussed here are correlational. The very factors that appear to undercut therapeutic success may be the factors that make individuals more susceptible to mental health problems in the first place. Individuals have needs left wanting or even worsened by the local cultures that envelope them, a prediction that Johnson and colleagues' (2010) ecological model makes. Thus, interventions might succeed in the sense that a young person comes to develop self-worth and perhaps even to experience lower anxiety levels. An intervention might thus succeed in the very short term—because needs are so deep—yet fail in the long run because surrounding networks are so strongly countervailing. If a troubled young girl's community is stuck in the mud, can she ever free herself of its stains?

References

Goldfarb, E. S., & Lieberman, L. D. (2020). Three decades of research: The case for comprehensive sex education. *Journal of Adolescent Health,* doi:10.1016/j.jadohealth.2020.07.036

Grabe, S., & Hyde, J. S. (2009). Body objectification, MTV, and psychological outcomes among female adolescents. *Journal of Applied Social Psychology, 39*(12), 2840-2858. doi:10.1111/j.1559-1816.2009.00552.x

Guttmacher Institute. (2021). Sex and HIV education. Retrieved from https://www.guttmacher.org/state-policy/explore/sex-and-hiv-education#

Harrington, J. R., & Gelfand, M. J. (2014). Tightness-looseness across the 50 united states. *Proceedings of the National Academy of Sciences of the United States of America, 111*(22), 7990-7995. doi:10.1073/pnas.1317937111 [doi]

Hatzenbuehler, M. L., Shen, Y., Vandewater, E. A., & Russell, S. T. (2019). Proposition 8 and homophobic bullying in california. *Pediatrics, 143*(6), 10.1542/peds.2018-2116. Epub 2019 May 13. doi:e20182116 [pii]

Johnson, B. T., Redding, C. A., DiClemente, R. J., Mustanski, B. S., Dodge, B., Sheeran, P., . . . Fishbein, M. (2010). A network-individual-resource model for HIV prevention. *AIDS and Behavior, 14*(Suppl 2), 204-221. doi:10.1007/s10461-010-9803-z [doi]

Payne, B. K., Vuletich, H. A., & Brown-Iannuzzi, J. L. (2019). Historical roots of implicit bias in slavery. *Proceedings of the National Academy of Sciences of the United States of America, 116*(24), 11693-11698. doi:10.1073/pnas.1818816116 [doi]

Price, M. A., McKetta, S., Weisz, J. R., Ford, J. V., Lattanner, M. R., Skov, H., . . . Hatzenbuehler, M. L. (in press). Cultural sexism moderates efficacy of psychotherapy results from a spatial meta-analysis. *Clinical Psychology: Science and Practice.*

Smith, S. G., Basile, K. C., Gilbert, L. K., Merrick, M. T., Patel, N., Walling, M., & Jain, A. (2017). National intimate partner and sexual violence survey (NISVS): 2010-2012 state report.

statusofwomendata.org. (2021). Violence & safety. Retrieved from https://statusofwomendata.org/explore-the-data/violence-safety/